



AFTAC

Air Force Technical Applications Center

Office of the Chief Scientist

(U) Guide to Publishing AFTAC Scientific and Technical Reports

(U) Short Title: AFTAC Writer's Guide

**S. W. Miller
S. A. Engel**

10 May 2012

**Approved for public release;
Distribution is unlimited**



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(U) AFTAC Writer's Guide

AFTAC-TR-11-03

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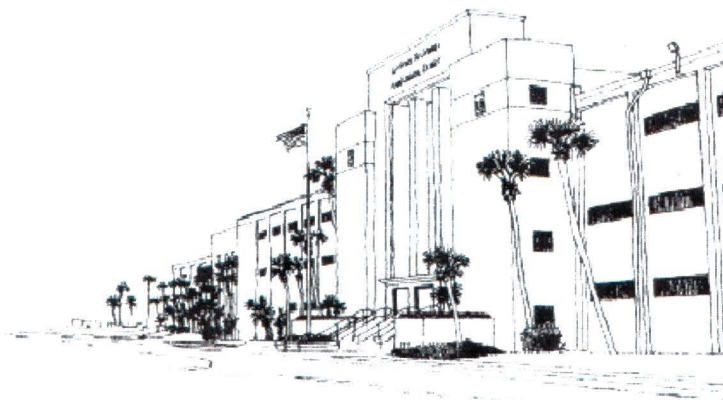
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(U) Report AFTAC-TR-11-03 has been reviewed and is approved for publication.



DAVID F. O'BRIEN
Chief Scientist

(U) This final report updates the approved method of writing Scientific and Technical Reports.

(U) The overall classification of this report is (*example only*):

SECRET

(U) Statement

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(U) PREFACE

(U) The Air Force Technical Applications Center (AFTAC), Scientific and Technical Information Office (STINFO) prepared this guide to assist in the publication of scientific and technical reports. This guide must not be confused with any Air Force Instruction, Center Instruction or DoD mandate. It can be used by all those involved in writing, designing, editing, protecting, and disseminating technical reports. It is applicable to DoD contractors as well as AFTAC scientists, engineers, and analysts.

(U) The publication of a technical report, just like the research upon which it is based, is an organizational function and should be subject to in-depth review and approval. While this guide is designed to provide helpful information on writing and organizing a technical report, it is not a substitute for expert editorial assistance. Errors in grammar, format, design and classification are often easier for an experienced editor to detect. This is especially true at AFTAC where compliance with specific publication formats and design is required.

(U) This guide follows its own guidance and can be used as a sample technical report.

(U) Publication of a technical report is a time-consuming process and it is to the author's benefit to work closely with a competent editor. I am very fortunate to have had the editorial assistance of Ms. S. Engel (Zel Technologies), Mr. R. VanVeghel (Defense Technical Information Center [DTIC]) and Mr. W. Redman (AFTAC/LSX). With the assistance of an editor, technical reports can become 100% error free.

(U) Users of this guide are encouraged to submit comments and suggestions to the author via e-mail: sabrina.miller@us.af.mil.

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(U) Guide to Publishing Air Force Technical Applications Center (AFTAC) Scientific and Technical Reports

(U) Summary

(U) This guide provides publishers of AFTAC scientific and technical reports with information that will ensure compliance with Department of Defense (DoD) directives, American National Standards Institute/National Information Standards Organization (ANSI/NISO) standards, and Air Force (AF) instructions. It acts as a sample technical report explaining and illustrating proper document organization, design, classification, secondary distribution, and bibliographic format.

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1 (U) Introduction

(U) Scientific and technical reports are the primary criteria upon which customers will judge the value of AFTAC's research mission and the validity of initiating future projects. If the reports are well organized and clearly written, they will be accepted as the valid results of sound analyses and observations. If the reports are disorganized and flawed with numerous errors in grammar and punctuation, they will be considered to be the products of a careless or incompetent organization.

(U) Taken together, the technical reports produced by AFTAC represent its research and development achievements. Because technical reports are applicable beyond the boundaries of AFTAC, they must be written in a communicative style and conform to adopted standards for uniform presentation and bibliographic control.

(U) Section 4 provides detailed descriptions and samples of the elements required in the preparation, organization, and distribution of technical reports. More detailed information on the Scientific Technical Information Office (STINFO) and assistance with the publication process is available in the STINFO office, BN-101, 321-494-4760 or DSN 854-4760.

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2 (U) Types of Reports

(U) DoD directives and coordinating AF instructions require the documentation of all results relating to scientific research, development, testing, and evaluation (RDT&E) through written scientific and technical reports. This requirement includes in-house, as well as contractual efforts, and demands completion even if the efforts were unsuccessful.

(U) CENI 61-201, *Research and Development*, requires the results of RDT&E conducted or sponsored by AFTAC to be published by scientific and technical reports or informal technical reports. The management of the publication process will typically be the responsibility of the project officer assigned to the effort.

(U) A scientific and technical report (TR) is a publication that records the results of analytic studies, RDT&E on an assigned task. It may be definitive, exploratory, or evaluative in purpose. Its format is governed by Data Item Description (DID) DI-MISC-80711A, *Scientific and Technical Reports*, which is used for pure R&D (definitive analysis). Documents prepared for publication in journals are not considered TRs. These items can include: unpublished manuscripts (do not have an author-personal or corporate, and/or publisher-office of primary responsibility), research proposals, technical manuals, technical specifications, purely technical data, and research papers. An informal technical report is a written account of studies, analyses, or evaluations intended to improve the operations, management, or administration of an organization. Its format is governed by DID DI-MISC-80508A, *Technical Report – Study Services*, which is used when no in-depth analysis of data is required.

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3 (U) Technical Writing

(U) The primary responsibility of the technical writer is to convey information clearly; to ensure the reader cannot misunderstand what is in the report. Through deciding what information to present, the technical writer must take into account what the readers already know and what they need to learn. The technical writer must also diligently tailor the use of scientific language to match the knowledge levels of the prospective readers.

(U) The value of any technical report lies in its ability to clearly present the analysis of technical data, evaluations of methods or systems, and introduce new solutions to operational problems. Because the subject matter of a technical report tends to be very complex and esoteric, the writer should use an expository writing style; selecting a format that moves the reader from the simple to the complex within the content and vocabulary usage. To accomplish this, the writer should plan the report very carefully. The report should be divided into sections and numbered consecutively. Paragraphs are typically shorter than in other types of writing and the usage of figures, tables, and charts are featured extensively.

(U) ANSI-NISO Z39.18-2005, *Scientific and Technical Reports-Preparation, Presentation and Preservation*, has been carefully written to provide the technical writer with a format that fosters uniformity, "while allowing for diversity of subject matter, purpose, and audience."¹ The use of this format will make the report useful to several different customers and will ensure "thorough, consistent, and uniform bibliographic description, and control of data essential to libraries... "¹ and other organizations that utilize the RDT&E prepared by AFTAC. **All AFTAC scientific and technical reports must be prepared in accordance with this standard. ANSI-NISO Z39.18-2005 is available in PDF format on the STINFO Home Page and the Project Officer's Resources folder on the NIPR P:\AFTAC-share\STINFO.**

¹ *Scientific and Technical Reports – Preparation, Presentation and Preservation*. ANSI-NISO Z39.18-2005, Bethesda, MD: NISO Press, 2005.VII.

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4 (U) AFTAC Technical Report Format

(U) ANSI-NISO Z39.18-2005 format requires the following sequence of report elements:

- (U) Front Matter:
 - Cover*
 - Title Page
 - Notices
 - Report Documentation Page (SF-298)
 - Abstract
 - Table of Contents
 - List(s) of Figures and Tables
 - Foreword*
 - Preface*
 - Acknowledgements*
- (U) Text (Body):
 - Summary
 - Introduction
 - Methods, Assumptions, and Procedures
 - Results and Discussion
 - Conclusions
 - Recommendations*
 - References
- (U) Back Matter:
 - Appendixes*
 - Bibliography*
 - List(s) of Symbols, Abbreviations, and Acronyms
 - Glossary*
 - Index*
 - Distribution List

* Indicates optional elements

4.1 (U) Cover (optional)

(U) The purpose of a cover is to protect the printed (paper) report. If a cover is used, it must contain the same information that is found on the title page. Reports that are bound or covered in a binder should be treated similarly. The spine, if present, should also contain the title and classification marking. Covers to non-print reports (CD-ROM and other media) should be treated the same way; particularly if they serve as permanent storage containers. AFTAC's generic cover, prepared in Microsoft Word (see cover), is the preferred cover for scientific and technical reports, and can be used by any directorate.

4.2 (U) Title Page (required)

(U) The purpose of the title page is to describe the technical report and maintain bibliographic control. Without a bibliographic description, a document would not be officially published and available for distribution. In addition, it could not be cataloged and stored in a library or information system.

(U) The required data elements of a title page are:

- (U) Report number: This is assigned by the STINFO manager for in-house reports and by the contractor for contract reports.
- (U) AFTAC logo.
- (U) Performing organization name (author affiliation).
- (U) Report title: If the title is classified, there must also be an unclassified short title.
- (U) Series title and number: Used if the report is part of a series of reports.
- (U) Author(s), principal investigator, editor, and/or compiler: The primary author always comes first; Signature blocks are not used, and only the full name is required; Military ranks are not required, but should accompany the author's name on the Report Documentation Page, SF-298; Use the abbreviations for rank as shown in *The Tongue and Quill, 2004, Air Force Handbook (AFH) 33-337*.
- (U) Publisher (AFTAC directorate and division), publication date (assigned by STINFO manager upon completing review), and place of publication.
- (U) If applicable, copy number for distribution control, e.g., 12 of 32 copies.
- (U) If applicable, contractor name and address.
- (U) If applicable, contract or grant number.
- (U) Distribution Statement: See 4.3, Distribution Statement.

(U) If the report is classified there must be a "Classified by" statement which includes the classifier's name and division. There must also be "Derived from" and "Declassify On" statements in accordance with Controlled Access Program Coordination Office (CAPCO) guidance (CAPCO Implementation Manual FOUO v4.1; 10Dec2010)

4.3 (U) Distribution Statement (required)

(U) In order to control secondary distribution of a technical report, an official distribution statement should be used on the cover, title page, and Report Documentation Page, SF-298. The official DoD distribution statements and the reasons for their use are found in Appendix B.

(U) A distribution statement consists of four elements:

- (U) Distribution level (A, B, C, D, E, F, X).
- (U) Reason the data is restricted from public release (Statement A has no reason since it is not restricted, as shown on the title page of this technical report).
- (U) Date of determination (when the statement and reason were selected).
- (U) Identity of the DoD controlling office (statement A has no DoD controlling office since the material has been cleared for public release).

(U) It is not necessary to put the code level on the title page, but it should be included on the SF-298. It is not necessary to use the complete mailing address, for this is found on the SF-298. Some examples of distribution statements are:

- (U) F - Further dissemination only as directed by AFTAC/TM, 1 April 2001, or higher DoD authority.
- (U) D - Distribution authorized to DoD components and their contractors only; administrative/operational use; 1 April 2001. Other requests for this document shall be referred to AFTAC/TT.

(U) Note: Distribution statement F is normally used on classified technical reports, and therefore, a reason is not required. When Originator Control (ORCON) is used to control the report, the only person authorized to approve further dissemination is the AFTAC Commander, AFTAC/CC.

(U) Complete instructions on selecting and writing distribution statements are contained in *A Quick Reference for Marking DoD Technical Documents* (U.S. Department of Defense 1998).

4.4 (U) Approval Statement (required)

(U) An approval statement must appear on the verso of the title page and include the signatures of the Director and AFTAC Commander. Official signature blocks are used.

4.5 (U) Notices (required)

(U) Special notices regarding classification, dissemination, proprietary information, and export warnings, should be located on the verso of the title page below the approval statement and signatures.

4.6 (U) Report Documentation Page, SF-298 (required)

(U) The purpose of an SF-298 is to provide bibliographic control for the technical report and to facilitate its classification and dissemination.

(U) A completed SF-298 must be included as the first right-hand page after the title page and should be numbered as page iii. Do not exceed the limits of block 14 for the abstract and do not use the back of the form for continuations. The distribution statement shown in block 12 should be the same as on the cover and title page, as well as the report title(s), number, date, and author(s).

(U) For in-house reports, put the complete mailing address in block 7, including the office symbol. If the report is classified, put the "derived from" statement in block 13, Supplementary Notes. Put only the overall classification (without Sensitive Compartmented Information [SCI] caveats and Director of Central Intelligence Directive [DCID] 1/7 markings) in blocks 16a-c. Block 17 is either UU (Unclassified Unlimited) or "Same as Report", written completely with no use of acronyms. Block 19a is usually the author for in-house reports or the project officer for contractor reports. Include as many subject terms (keywords) in block 15 that will fully describe the contents of the report. The SF-298 is available on the AFTAC Share drive within the STINFO folder, under "AFTAC -- Technical Report Writing Resources." It is also available online on the Defense Technical Information Center (DTIC) SIPRNET website:

http://www.dtic.smil.mil/dtic/pdf/submit/SF0298_fillable.pdf or on NIPRNET at

http://www.dtic.mil/dtic/pdf/submit/sf0298_fillable.pdf. Detailed instructions for filling out the SF-298 are found on the back of the form. A sample is included in Appendix C.

4.7 (U) Abstract (required)

(U) The purpose of an abstract is to provide a summary of the research and to assist readers in determining the value of reading the text. The abstract should never contain information not found elsewhere in the text and should not refer the reader to sections contained in the text. It is recommended the abstract be no larger than 200 words. The abstract, found on the Report Documentation Page (SF-298), can be used in place of a separate abstract section. ANSI-NISO Z39.14-1997, *Guidelines for Abstracts*, is the standard guide for preparing abstracts for scientific and technical reports.

4.8 (U) Table of Contents (required)

(U) The table of contents begins on page v and is titled simply "Contents." It includes the title and beginning page number of each section and subsection of the report. Subsections are indented differently from the main sections and may be set in another type-style. Third-level subsections are not required, but if they are listed all the subsections must be indicated; not just a few portions selectively chosen. Include any appendices, lists (distribution, references, abbreviations, symbols, acronyms, etc.), indexes, bibliographies, or glossaries.

4.9 (U) List(s) of Figures and Tables (required for five or more)

(U) If a report contains five or more figures, tables, or a combination thereof, a list of the figures and/or tables is included with its corresponding page numbers. (See figures and tables in Section 5.) Otherwise, the lists are optional. If the table of contents does not exceed half a page, list of figures or tables (or a combined list thereof) may also be placed on the bottom half of the same page.

4.10 (U) Foreword (optional)

(U) This is a statement about the report written by someone other than the author. It should include the name and affiliation of the writer.

4.11 (U) Preface (optional)

(U) A preface defines the intended audience and states the purpose and scope of the report; often highlighting specific projects or programs. It may also include recognition of persons who assisted in research, development, testing, or evaluation. The preface does not summarize the problem, or state the conclusions of the report.

4.12 (U) Acknowledgements (optional)

(U) An acknowledgement section is used when recognition of technical assistance is too lengthy to include in the preface.

4.13 (U) Summary (required)

(U) The summary is the first page of text (body) and is numbered page 1. It should clearly state the problem, the key points of the report, important results, conclusions and recommendations. The summary should never introduce material not found elsewhere in the text. It does not contain references. If a report exceeds 50 pages in length, a separate "executive summary" is often prepared for management-level audiences.

4.14 (U) Introduction (required)

(U) The introduction presents the background, purpose, problem being addressed, and scope of the research, test, or evaluation. It states the reasons for the investigation and its limitations.

4.15 (U) Methods, Assumptions, and Procedures (required)

(U) This portion is the main body of the report and describes the research in depth. The description usually moves from simple to complex within the vocabulary and content, so that several different levels of readers can benefit. Items that should be identified and explained are: 1) system of measurement, 2) description of instruments or equipment used, 3) parameters for testing and evaluation, and 4) methods and procedures used to obtain technical data.

4.16 (U) Discussion and Results (required)

(U) The findings of the RDT&E and a discussion of their significance can be presented together in one section or separately. The discussion section tells how accurate the testing and measurements were conducted as well as the results' significance might pertain to the research's main objective. The technical data used to directly support the results are included within the results section via tables and figures. Technical data that are not essential to the understanding of the results are included in the appendix.

4.17 (U) Figures and Tables (required)

(U) Technical data are always presented in a scientific and technical report by means of figures and tables. The formats, presented in *The Tongue and Quill*, 2004, ANSI-NISO Z39.18-2005, sections 6.2.1, 6.2.2, and 6.2.3 are followed. Generally, a table or figure should not exceed the normal margins of the document; the font size is usually smaller (no smaller than 8 points) than the normal text to accommodate this.

(U) Figures and tables should be numbered consecutively in Arabic numerals preceded by the word "figure" or "table." Do not use section numbering. Figures and tables appearing within an appendix should be numbered using the appendix designation, e.g., Table A-1 for the first table in Appendix A. Each figure and table should have a title immediately following the number. The classification of the title must also appear before the title, e.g. Table 1. (S) Example Only.

(U) The table number and title appear on top of the table and all major words in the table's title should be capitalized. The figure number and title appear on the bottom of the figure and only the first word of the figure's title is capitalized. The column headings in a table are capitalized, but not the whole word.

4.18 (U) Conclusions (required)

(U) The purpose of the conclusions section is to provide the author's assessment of the results or findings. Were the goals and objectives of the RDT&E achieved? If the conclusion includes the author's opinion, the heading should be "Concluding Remarks."

4.19 (U) Recommendations (optional)

(U) The author may suggest a course of action, such as additional RDT&E, alternate methods and/or approaches, or production/operational considerations. The use of a bulleted format is recommended.

4.20 (U) References (required)

(U) The author-date format is preferred. List all citations alphabetically by author's last name, followed by the year of publication. Additional bibliographic information should include title (in italics), place of publication, and publisher. If the work cited is a periodical article, the title of the article should be in quotation marks and the title of the journal, magazine, or newspaper in italics. Periodical volume, issue, and page numbers should be included. If the work cited is a government document (National Technical Information Service [NTIS]; DTIC), include the report number. The references section should appear on a separate page in the technical report. References should be portion-marked like the rest of the report, and the classification of the original document must be included at the end of the citation.

(U) If the author-date format is not feasible (e.g., too many references with no authors), use the number-identification system in which the Arabic numbers are used in the text to refer to numerically listed citations in the references section. Citations should contain complete bibliographic information as shown in the sample on page 36.

(U) If footnotes are used, the author-date format should also be used so there is only one numbering system for references.

(U) *The Air University Style April 2005*, referenced in *The Tongue and Quill*, 2004, AFH 33-337, has several pages of bibliography examples and is the guide that governs bibliographic format for all scientific and technical reports published by AFTAC. Classified titles should never be referenced in an unclassified report. If the references section contains unclassified citations to classified documents or technical reports, it should be labeled "For Official Use Only."

4.21 (U) Appendixes (optional)

(U) Supplemental information not essential to understanding the report is contained in an appendix (i.e., extensive technical data obtained during RTD&E, texts of supplementary documents, test procedures, equipment manuals, or instructions.) Each appendix should begin on a new, right-hand page, and be labeled with a title that appears two lines below the heading. Multiple appendixes must be labeled with capital letters (i.e., Appendix A, Appendix B, etc.) Figures, tables, and equations contained in an appendix must be numbered sequentially in each appendix (e.g., B-1, B-2.)

4.22 (U) Bibliography (optional)

(U) Citations to information sources not referenced in the text of the report are contained in a bibliography. A bibliography is a list of sources recommended by the author(s) for further research. It should be alphabetically arranged by the author's last name. Sample citations have been provided in the bibliography of this report.

4.23 (U) List of Symbols, Abbreviations, and Acronyms (required)

(U) If there are more than five symbols, abbreviations, and/or acronyms within the text, a list designating their meaning is required. This will serve as a means of interpretation for readers unfamiliar with the described contents of the report. The list should begin on a new, right-hand page, containing the proper labels and markings of a table or distribution list.

4.24 (U) Glossary (optional)

(U) This section defines and explains unfamiliar terms used in the report. It is arranged alphabetically and is marked like a table or distribution list.

4.25 (U) Index (optional)

(U) If the report is over 50 pages, an index of key terms and names is recommended. An index typically includes subjects and names of persons, places, things, and shows the pages on which they can be found.

4.26 (U) Distribution List (required)

(U) This section provides a permanent record of the initial distribution of the report. It should be marked like a table in accordance with AFTAC classification guidance. It is arranged by relative importance of addresses, with internal distribution being listed at the end. Each entry should have a complete mailing address (for external) along with the number of copies intended for distribution. A distribution list is very important; it can be later used to forward instructions regarding classification changes or corrections/amendments to the original document.

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5 (U) Technical Report Design

5.1 (U) Figures

(U) Graphs, charts, maps, diagrams, photographs, and schematic drawings must conform to the design standards stated in ANSI-NISO Z39.18-2005, section 6.2.2. Additionally, figures contained in classified reports must be portion-marked with the classification shown above and below the figure, preferably outside the area of the figure itself. In the example shown below the classification markings are text boxes grouped with the picture in PowerPoint, and then copied and pasted into the Microsoft Word document using the “Paste Special” function. The object was pasted as a “Picture (Enhanced Metafile)” to ensure that in the event the figure is copied, the classification annotations will be included. The title of the figure should also be portion-marked. The figure number and title should be placed below the figure and only the first word of the title should be capitalized. See Figure 1 below for sample format.

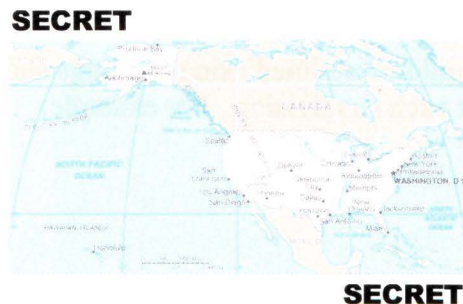


Figure 1. (U) Map of North America

(UNCLASSIFIED sample—for training purposes only)

5.2 (U) Tables

(U) Technical data or statistics that need to be displayed in row-and-column format (spreadsheet) should conform to the tables' standard stated in ANSI-NISO Z39.18-2005, section 6.2.3. In addition, tables contained in classified reports must be portion-marked with a statement directly below the title of the table. The last row of the table should contain the classification to ensure that in the event the table is copied, the classification annotations will be included. Capitalize each word in the title, column, and row headings. See Table 1 below for sample format.

Table 1. (U) Analysis of Sample 1

(This table is UNCLASSIFIED)

Element	Concentration (weight percent)	Relative Standard Deviation (percent)
F ^c	66.3	1.5 ^a /
C ^r	16.8	2.2
N ⁱ	11.8	4.2
S ⁱ	2.8	26
^a / Table footnote		
This table is UNCLASSIFIED		

5.3 (U) Numbering

(U) All front matter pages (title page, SF-298, abstract, table of contents, lists of figures and tables, foreword, preface, acknowledgements) are numbered with lower case Roman numerals (ii, iii, iv, etc.). The title page is always page i, but the numeral is not shown. The text or body of the report, starting with the Summary and including references section, appendixes, bibliography, blank pages, list of acronyms, and distribution list should be numbered consecutively in Arabic numerals (1, 2, 3, 4, etc.). Numbers should be at the bottom center of each page. The cover is not numbered.

(U) Each major section of a report begins on a new, right-hand page. This also applies to the title page, summary, references, bibliography, appendixes, list of symbols and abbreviations and distribution list.

(U) Blank pages must be marked: "This page intentionally left blank."

(U) The body of the report should be outlined using headings and subheadings numbered consecutively using points for each subdivision. For example:

- 1 (U) World Wars
 - 1.1 (U) World War I
 - 1.2 (U) World War II
 - 1.2.1 (U) European Theater
 - 1.2.2 (U) Pacific Theater
 - 1.2.2.1 (U) Battle of the Coral Sea
 - 1.3 (U) World War III

(U) Enumeration should not exceed five levels deep for reports shorter than 50 pages. There may be multiple paragraphs under a subheading and they do not need to be numbered. However, it is acceptable and often helpful to number every paragraph, particularly in some types of publication formats, like html. Headings and subheadings should be printed in bold font style. For enumerations within a single sentence, use numbers followed by a right parenthesis as shown in section 4.15, "Methods, Assumptions and Procedures." Use commas for separation of enumerations within a sentence of four lines or less. Use semicolons to separate enumerations within lengthy sentences (more than six lines).

5.4 (U) Formats

(U) The following formats are intended to facilitate uniformity in the publication of AFTAC technical reports and can be accomplished using Microsoft Word.

5.4.1 (U) Document

(U) Adobe Portable Document Format (PDF) is recommended. It can be viewed on Microsoft Windows, Macintosh Operating System (Mac OS), and UNIX platforms in its original publication format and design. Because it incorporates custom hyperlinks, PDF is more compatible with Web search engines and the development of digital libraries.

(U) Also, PDF contains security features not available with Microsoft Word or html. These protections ensure document authenticity upon secondary distribution.

5.4.2 (U) Page

- (U) 8.5 x 11, white paper (or background), portrait orientation.
- (U) Full-page format is highly recommended, however, two-column format is acceptable (3¼ inches wide, 8½ inches long; gutter is ¼ inch).
- (U) Printing on both sides is encouraged.
- (U) Text begins 1¼ inch from the top of the page.
- (U) Pages are offset left-right: 1 inch inside and bottom margin, and ¾ inch outside margin.
- (U) CAPCO markings are centered ¼ inch from the top and bottom of the page.
- (U) Page number is centered, ¾ inch from bottom of page.
- (U) TR number is ¾ inch from the top of the page, and is right justified.

5.4.3 (U) Paragraph

- (U) Alignment is left, with no indentation.
- (U) Two spaces after punctuation marks (period, colon, etc.).
- (U) One line between paragraphs.
- (U) Alignment on the left side, “ragged” on the right.

5.4.4 (U) Sentence

(U) Quotation marks are outside of commas, periods, question marks and semi-colons.

5.4.5 (U) Word

- (U) Body text is 12 points, with a black, regular Times New Roman font.
- (U) Main section headings (Level 1) are 16 points, bold; Subheadings (Level 2) are 14 points, bold and (Level 3) 12 points, bold.
- (U) CAPCO headings (top and bottom center of page only) are 16 points, Arial Black font in red.
- (U) The title (cover and title page) is 16 points, bold font.
- (U) Short title (cover and title page) is 14 points, bold font.
- (U) Text inside tables is 10 points, regular font.
- (U) Titles of books, periodicals, and published technical reports are in italic font.

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6 (U) Technical Report Marking

(U) All classified technical reports must be portion-marked in accordance with the CAPCO guidance and Department of Defense Directive (DODD) 5200.1-R. The latest version of CAPCO guidance is available on the intranet under Classification Guides/CAPCO Links Controlled Access Program Coordination Office Website/CAPCO Resources/Marking References: CAPCO Register_FOUO_v4.1_10Dec2010 and CAPCO_Implementation_Manual_FOUO_v4.1_10Dec2010. Together these documents define and describe the approved classification and control markings system. Note: Updates to these documents are available upon their release.

(U) In addition to classification markings, distribution statements should be used to limit the secondary distribution of technical reports that contain sensitive and proprietary information. See 4.3, "Distribution Statement." Complete instructions on selecting and writing distribution statements are contained in *A Quick Reference for marking DoD Technical Documents* (U.S. Department of Defense 1998).

(U) Additional reminders:

- (U) Control markings on the top and bottom of each page must be written completely out and not abbreviated.
- (U) When using "multiple sources," document all the classification guides that apply, preferably on the cover page. If numerous guides are utilized, document classification guides on the verso of the title page in the "Notices" section located beneath the signature approval blocks.

SECRET

(For training purposes only; otherwise UNCLASSIFIED)

REPORT DOCUMENTATION PAGE			Form Approved OMB No. 0704-0188		
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing this collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports (0704-0188), 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ADDRESS.					
1. REPORT DATE (MM-DD-YYYY) 05-25-2010		2. REPORT TYPE Final Technical Report		3. DATES COVERED (From - To) 12-24 July 2009	
4. TITLE AND SUBTITLE (S) Guide to Publishing AFTAC Scientific and Technical Reports Short Title: (D) Publishing Technical Reports			5a. CONTRACT NUMBER		
			5b. GRANT NUMBER		
			5c. PROGRAM ELEMENT NUMBER		
6. AUTHOR(S) Ms. S. W. Miller (STINFO) Ms. S. A. Engel (Zel Technologies)			5d. PROJECT NUMBER		
			5e. TASK NUMBER		
			5f. WORK UNIT NUMBER		
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12. DISTRIBUTION / AVAILABILITY STATEMENT SECRET F- Further dissemination only as directed by AFTAC/CA, 1 September 2011, or higher DoD authority.					
13. SUPPLEMENTARY NOTES DERIVED FROM: AFTAC GSSCG 1 January 2011 DECLASSIFY ON: 25X1, 31 December 2059					
14. ABSTRACT (S) This guide provides publishers of AFTAC scientific and technical reports with information that will ensure compliance with DoD directives, American National Standards Institute (ANSI) standards, and Air Force instructions. It acts as a sample technical report, <i>per se</i> . It explains and illustrates proper document organization, design, classification, secondary distribution, and bibliographic format.					
15. SUBJECT TERMS (U) Technical writing (U) Writing (U) Technical reports (U) STINFO (U) Scientific literature (U) Editing					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same As Report	18. NUMBER OF PAGES XX	19a. NAME OF RESPONSIBLE PERSON Sabrina W. Miller
a. REPORT SECRET	b. ABSTRACT SECRET	c. THIS PAGE SECRET			19b. TELEPHONE NUMBER (include area code) (321) 494-4760 DSN 854-4760

Standard Form 298 (Rev. 8-98)
Prescribed by ANSI Std. Z39.18

Appendix D

(U) Revision Checklist for Technical Reports

Content

- Are all data complete?
- Are all data accurate?
- Are all data unbiased?
- Are all data easily interpreted?
- Are the sources of data, if provided, credible?
- Does the report have a clear statement of purpose?
- Are the limitations of analysis clearly stated?
- Are figures clear and do they aid in analysis?
- Does the report adequately describe research methodology?
- Does the report present all findings and discuss their significance?
- Is the analysis free of unsupported reasoning?
- Are recommendations based on unambiguous interpretations?
- Are references adequate and correct?

Format and Design

- Does the report have an official distribution statement on the cover and title pages?
- Does the report have a Report Documentation Page, SF-298?
- Does the report have the following required elements:
 - Title Page?
 - Notices Page (with commander & director signature blocks)?
 - Abstract (in SF-298)?
 - Table of Contents?
 - List(s) of Figures and Tables?
 - Summary?
 - Introduction?
 - Conclusion?
 - References?
 - List(s) of Symbols, Abbreviations, and Acronyms?
 - Distribution List?

- If the report is classified, does it also have an unclassified short title on the cover and title page?
- If the report is classified, has each page been marked individually and the overall classification placed on the cover, title, and back pages?
- Do the following pages start on a new right-hand (odd numbered) page: title; SF-298; table of contents; page 1; first pages of appendixes, distribution list, and list of abbreviations?
- Are the front matter pages numbered in lower case Roman numerals?
- Are all the figures and tables numbered and labeled properly?
- Are the references properly cited, including title, author, date, publisher, page numbers (if journal article), and document number (if technical report)?
- Does the distribution list include one copy for AFTAC CA-STINFO?
- Does the report have a report number (assigned by STINFO manager for in-house reports or the contractor for contract reports)?

Style

- Is the level of scientific knowledge appropriate for the stated audience?
- Has the computer checked the report for spelling and grammar mistakes?
- Have statistics been put in tables and figures rather than written into the text?
- Have tables and figures been placed near the related text, not at the back of the report?
- Does the report have the best possible format to enhance the message?
- Has an editor or colleague proofread the report?

Bibliography

Allin, Nancy. "The Air Force Technical Publications Program: A Personal Reflection on Yesterday, Today, and Tomorrow." *Government Information Quarterly* 8, no. 2 (Summer 1991): 155-65.¹

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Ebbitt, Wilma R., and David R. Ebbitt. *Writer's Guide and Index to English*. 7th ed. Glenview, IL: Scott Foresman, 1982.³

Lannon, John M. *Technical Writing*. 5th ed. New York: HarperCollins, 1991.⁴

Sabin, William A. *The Gregg Reference Manual*. 8th ed. Westerville, OH: Glencoe/McGraw Hill, 1996.⁴

Sageev, Pneena. *Helping Researchers Write... So Managers Can Understand*. Columbus: Battelle, 1986.⁴

U.S. Department of Defense. Office of the Under Secretary of Defense for Acquisition & Technology. *Militarily Critical Technologies*. Online. <http://www.dtic.mil/mctl/>⁵

U.S. Department of the Air Force. Air Force Research Laboratory – Wright Research Site. Technical Information Division. *Guide to Technical Publishing*. AFRL-WS-WP-TR-1998-9003. Wright-Patterson AFB, OH, August 1998.⁶

U.S. Government Printing Office. *United States Government Printing Office Style Manual 2008, 30th Edition*. Washington, DC: U.S.G.P.O, 2000.⁷

¹ Journal article

² Book, no author

³ Book, two authors

⁴ Book, one author

⁵ Website

⁶ Technical report

⁷ Government document

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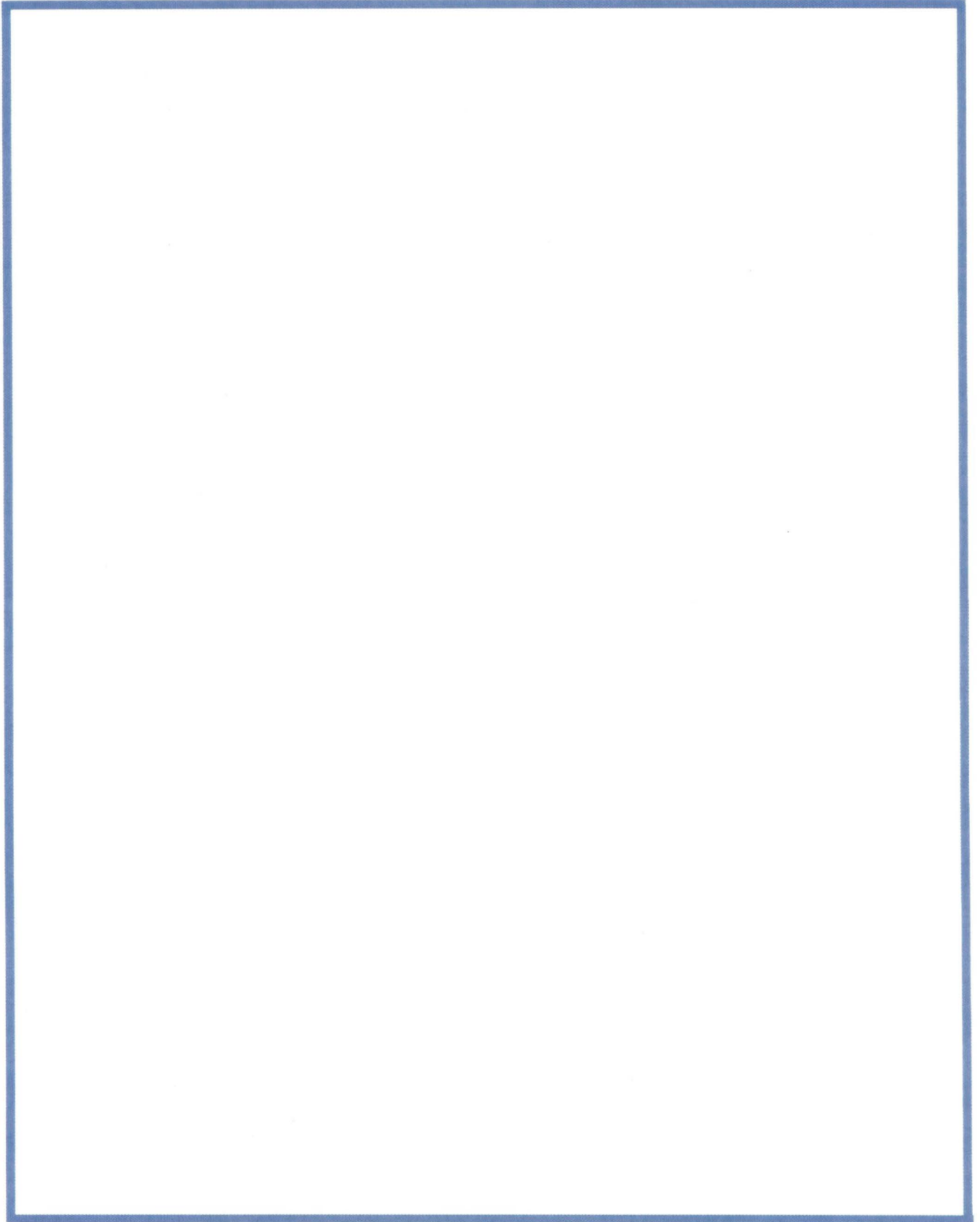
List of Symbols, Abbreviations, and Acronyms

Symbol, Abbreviation, Acronym	Definition
AFEPL.....	Air Force Electronic Publications Library
AFRL.....	Air Force Research Laboratory
AF.....	Air Force
AFTAC.....	Air Force Technical Applications Center
ANSI.....	American National Standards Institute
CAPCO.....	Controlled Access Program Coordination Office
DCID.....	Director of Central Intelligence Directive
DID.....	Data Item Description
DoD.....	Department of Defense
DODD.....	Department of Defense Directive
DTIC.....	Defense Technical Information Center
MacOS.....	Macintosh Operating System
NISO.....	National Information Standards Organization
NTIS.....	National Technical Information Service
ORCON.....	Originator Control
PDF.....	Portable Document Format
RDT&E.....	Research, Development, Testing, & Evaluation
SAR.....	Same As Report
SCI.....	Sensitive Compartmented Information
STINFO.....	Scientific and Technical Information
TR.....	Technical Report
UU.....	Unclassified Unlimited

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Distribution List

Organization	Number of Copies
Defense Technical Information Center Attn: OMI, Input Support Branch 8725 John J. Kingman Rd. STE 0944 Ft. Belvoir, VA 22060-6218	1
Air Force Technical Applications Center	
AFTAC/CA	1
AFTAC/DO	1
AFTAC/LS	1
AFTAC/TA	1
AFTAC/TC	1
AFTAC/TM	1
AFTAC/TT	1
AFTAC/CAS	7



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7 (U) Technical Report Editing, Review, and Approval

7.1 (U) Editing and Review

(U) Among the various directorates, the editing and review process will differ, but there are three general stages in the cycle that should be followed: branch level, division level and directorate approval/signature review.

(U) The first stage would be a branch-level review to ensure accuracy of the technical data and written information. Technical errors are less-frequently noticed than grammatical errors. They can, however, be the most dangerous. These types of errors must be spotted within the first stage; as reviewers do not have the facility to check the data once the report leaves the originating office. It is also essential that report classification and proper marking is correct to ensure the document's protection.

(U) The second stage would be a division review that includes the assistance of an editor or someone skilled in proofreading to correct grammatical and technical errors. The editor must communicate clearly with the author in order to ensure that any proposed changes would not distort the original meaning of the text. Editors must be vigilant to not sacrifice meaning for clarity's sake. Conformity to ANSI-NISO Z39.18-2005 is checked at this stage and the document is usually converted from a draft to a page layout format. A completed final copy is then sent to the Division Chief for approval.

(U) The third stage would involve directorate approval and submission to the STINFO program manager for review. The STINFO review involves checking for classification markings, SF-298, a distribution statement, grammatical errors, as well as the other report elements listed in this guide. Upon completion of STINFO review and remedied changes, the report is submitted to the AFTAC Chief Scientist for review and approval. The author will then be notified if clarification needs to be implemented.

(U) To ensure the highest quality standards for AFTAC technical reports are sufficiently met, these are the recommendations each directorate should consider following:

- (U) Establish a structure to the editing cycle that will ensure consistent degrees of editing. Appoint a technical editor who has a strong writing background and a fact checker who can double-check the technical data. If an editor cannot be appointed, consider soliciting the services of the STINFO program manager to act as the initial editor.
- (U) Ensure the greatest diversity possible within the review process. All reports need to be carefully reviewed; however the branch-level staff might not have the technical knowledge to catch all the errors or potential misrepresentations. For example, a statistician can provide invaluable comments on data validity and presentation, but might find themselves significantly challenged regarding the difference between punctuations and participles.
- (U) From receipt of the first draft until the completed publication is ready for distribution, always seek and include the author's feedback when attempting to implement any editorial changes.

(U) Typically, if these suggestions are followed, the authors could become more responsible for their work; resulting in fewer major revisions.

7.2 (U) Proofreading and Editing Tips

- (U) Slow down while reading (or re-reading) the material.
- (U) Proofread the technical data twice.
- (U) Read numbers digit by digit, rather than units (tens, hundreds, thousands, etc).
- (U) Request a colleague's assistance with proofreading numbers that appear in tables. Read the figures aloud and have your colleague mark all corrections and changes on the manuscript.
- (U) Ensure proper alignment of all columns containing decimal points.
- (U) Use a blank sheet of paper to cover the material that has yet to be proofread. If using Microsoft Word, use the "track changes" feature under Tools to make comments apparent to other reviewers. Read the manuscripts backwards to better focus on each word's spelling.

(U) The following proofreading symbols are used at AFTAC:

^	Insert copy
≡	Capitalize
↘	Delete, omit
◻	Insert period
/	Cross out mistake, write the correct letter above, or make lower case
#	Add a space
no¶	Remove paragraph break
¶	Start a new paragraph

8 (U) Grammar

(U) The rules of grammar in *The Tongue and Quill, 2004, AFH 33-337*, should be followed when writing technical reports. Because technical reports are required to conform to ANSI/NISO Z39.18-2005, however, certain conflicts of grammar, punctuation and capitalization might arise. Consultation with the STINFO program manager may offer some suggestions to remedy this.

8.1 (U) Numbers

(U) Follow the guidance in *The Tongue and Quill, 2004, AFH 33-337*, on how to express numbers in a document. Exercise caution when using numerical figures in place of words. For specific examples, see pages 288, 293, 299, and 302, 311. Note that plurals of numbers are formed with the addition of an "s;" e.g., the 1960s (never 1960's), or 500s (never 500's).

8.2 (U) Units and Equations

(U) Follow the guidance in ANSI-NISO Z39.18-2005 on the standard format for units of measurement (Section 6.5) and for formulas/equations (Section 6.6).

8.3 (U) Punctuation

(U) Follow the guidance in *The Tongue and Quill, 2004, AFH 33-337*, on how to use punctuation marks (see pages 273-307 for specific examples.) When using commas, it is important to remember a point within sentence structure for clarity.

- (U) Comma: The use of a comma before the final conjunction in a series of words is recommended to add clarity (see page 287). For example, "We will divide the \$100 amongst John, Bill, Mary, and Sue" might be construed differently than "We will divide the \$100 amongst John, Bill, Mary and Sue." It could be argued that in the first instance each person gets 25%, but in the second sentence Mary and Sue must share one-third, whereas John and Bill each get one-third.
- (U) Dashes: Use an en dash rather than a hyphen to indicate continuing numbers, dates, or times; e.g., Figures 2–7 (not Figures 2-7). When using words to express the continuation, be consistent and never use the dash; e.g., between 1966 and 1968 (never between 1966-1968), or from 1000 to 1215 (never from 1000-1215).

8.4 (U) Abbreviations

(U) Follow the guidance in 2004 edition of *The Tongue and Quill, 2004, AFH 33-337*, pages 263-316. Strive for consistency throughout the report. For other abbreviations, use the *United States Government Printing Office Style Manual 2008, 30th Edition*. When abbreviating units of measure, be sure to stay consistent to ensure the elimination of internal and terminal punctuation. If there is an ambiguity (e.g., "in" for inch), spell out the word.

(U) Dates should be fully abbreviated or spelled out. Use 10 Apr 01 or 10 April 2001 (not 10 Apr 2001 or 10 April 01)-fully spelled out is preferred (see page 332).

8.5 (U) Capitalization

(U) Use the *United States Government Printing Office Style Manual 2008, 30th Edition* to determine proper capitalization of words. A PDF-version is available P:\AFTAC-Share\STINFO\AFTAC -- Electronic Resources, Forms, Training\ inside the "Helpful Documents", "Project Officer Resources", "Technical Report Writing Resources", "Test Plan Resources", and "Test Report Resources" folders on both SIPRNET and NIPRNET; it is also on the Internet at <http://www.gpoaccess.gov/stylemanual/browse.html>. Additionally, hard copies can be ordered through the STINFO office.

8.6 (U) Collective Nouns

(U) Be careful with collective nouns like "team," "committee board," "group," and "member." These are singular words that refer to specific groups of people or things. Use a singular verb and pronoun: *The committee likes to take its break in the cafeteria.* When casual shifts in number occur, they are certain to look awkward in formal writing: *The staff praises itself for improving productivity, yet the supervisor berates them for bad conduct.* To be consistent, change the collective subject. *The members of the staff praise themselves for improving productivity, yet the supervisor berates them for bad conduct.*

(U) As a general rule, if the group is acting as one unit, use a singular verb. If members of the group are acting separately, use a plural verb. *The jury has reached a decision. The jury members have not reached a decision.*

8.7 (U) Words

(U) Affect/Effect: Affect is a verb meaning to alter, influence or change. *The instrument's effect on the environment will affect how we will use it.* (The noun form of the word affect is seldom used.)

(U) Data is/data are: Data is the plural form of datum, but it can be used as a singular word, e.g., until more data is available.

(U) His/Her: If both male and female are involved, it is better to change the wording from singular to plural. Instead of saying, *each manager must meet with his/her staff*, use the plural form: *managers must meet with their staffs.* And do not use the hybrid s/he. Use the pronouns "they" or "you" instead. Use inclusive language as much as possible but avoid mistakes like the following, which appeared in the *Missileer*: *After a civilian attends four classes..., they will be awarded a certificate of completion...*

(U) Active verses Passive Voice: Create dynamic and powerful writing by using active rather than passive verbs. The active voice is preferred because the passive is more wordy and roundabout, it muddles the meaning and hides responsibility, and it is amateurish and dull. Microsoft Word will automatically prompt to change passive to active, but this does not mean the passive is incorrect or always bad. The passive voice is appropriate when:

- "Doer" is unknown. *The unit was built in 1952.*
- "Doer" is Unimportant. *The unit was shipped yesterday.*
- "Doer" is better left unsaid. *The samples were collected yesterday.*

9 (U) Contractor Reports

(U) Contractors prepare technical reports according to the guidance contained in the two DIDs descriptors: DI-MISC-80711A, Scientific and Technical Reports, and DI-MISC-80508, Technical Report – Study Services. If the contract requires documentation regarding the results of RDT&E by an in-depth scientific and technical report, the instructions contained in DID 80711A should be followed. DID DI-MISC-80711A requires compliance with the format in ANSI-NISO Z39.18-2005, Scientific and Technical Reports - Elements, Organization, and Design. If the contract requires that the results of RDT&E be documented by an ordinary technical report (studies/analyses performed), the instructions in DID DI-MISC-80508 should be followed. DID DI-MISC-80508 does not require compliance with ANSI-NISO Z39.18-2005 and the contractor's format is acceptable.

10 (U) Conclusions

(U) The credibility of a research project depends upon the quality of the final scientific and technical report. Without discernible organization, good grammar, and error-free punctuation and spelling, a technical report will not be convincing. In order for a technical report's message to be acceptable, it must be clear and concise, and free from ambiguities and mistakes. In order for statistical comparisons and technical data to be credible, well-designed and properly documented tables and figures should be included. Customers read technical reports to find useful information. Readers usually prefer a well-organized report that satisfies their informational needs quickly and efficiently. Universally, readers of all levels dislike inaccurate and disorganized reports; ultimately finding them to be a waste time and money. Inaccurate or unclear reports could also lead to injury, damage, or loss of life. Appendix C is a checklist to assist in publishing technical reports. To ensure the best possible report, however, a capable editor should review, proofread and ultimately guide the draft to its' final publication.

Appendix A

(U) STINFO Instructions and Directives

API 31 -401, Information Security Program Management

API 33-360VI, Attachment 4, Editorial Guide for Drafts and Guidance for Preparing, Reviewing, and Editing Publications

API 61-201, The Local Scientific and Technical Information Process

API 61-202, United States Air Force Technical Publications Program

API 61-204, Disseminating Scientific and Technical Information

API 61-205, Sponsoring or Cosponsoring, Conducting, and Presenting DOD-Related Scientific Papers at Unclassified and

Classified Conferences, Symposia, and other Similar Meetings

API 61 -302, Cooperative Research and Development Agreements

APPD 61-2, Management of Scientific and Technical Information

APPD 61-3, Domestic Technology Transfer

CAPCO, CAPCO MANUAL 10 DECEMBER 10, v4.1

CENI 61-201, Scientific and Technical Information (STINFO) Management

DODD 3200.12, DoD Scientific and Technical Information Program

DOD 3200. 12-R4, Domestic Technology Transfer Program Regulation

DoDM 5200.01, Vols. 1-4, February 24, 2012, DoD Information Security Program

DOD Instruction 5230.27, Presentation of DOD-Related Scientific and Technical Papers at Meetings

DOD Pamphlet No. 5230.25-PH, Control of Unclassified Technical Data with Military or Space Application

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Appendix B

(U) Distribution Statements

Table B-1. (U) Distribution Levels and Codes

(This table is UNCLASSIFIED)

Distribution Statement Level/Code	Description
A	Approved for public release; distribution unlimited
B	Distribution authorized to US government agencies only (reason) (date of determination). Other requests for this document shall be referred to (controlling DOD office).
C	Distribution authorized to US government agencies and their contractors (reason) (date of determination). Other requests for this document shall be referred to (controlling DOD office).
D	Distribution authorized to DOD and US DOD contractors only (reason) (date of determination). Other requests for this document shall be referred to (controlling DOD office).
E	Distribution authorized to DOD components only (reason) (date of determination). Other requests for this document shall be referred to (controlling DOD office).
F	Further dissemination only as directed by (controlling office) (Date of determination) or DOD higher authority.
X	Distribution authorized to US government agencies and private individuals or enterprises eligible to obtain export-controlled technical data in accordance with DODD 5230.25 (date of determination). Controlling DOD office is (insert).
This table is UNCLASSIFIED	

Table B-2. (U) Reasons for Limiting Secondary Distribution
(This table is UNCLASSIFIED)

Reasons	Distribution Code						
	A	B	C	D	E	F	X
ADMINISTRATIVE/OPERATIONAL USE. This information describes administrative procedures or operations with technical content (such as equipment maintenance or weapons operations manuals). Such information may be Unclassified but is considered sensitive information and its distribution should be limited to entities that need it for Government purposes or to conduct official business with DoD.		X	X	X	X	X	
CONTRACTOR PERFORMANCE EVALUATION. The information derives from the management review of a program, contractor, performance records, or other advisory documents evaluating a contractor program. Routine dissemination of such results outside the designated audience could result in unfair advantage or disadvantage to the contractor.		X			X	X	
CRITICAL TECHNOLOGY. The technology or information is on the US Munitions List or the Commerce Control List and release of the technology or information to other than the designated group will have a negative impact on US military activities or help potential adversaries overcome military deficiencies. Contractors must be registered with DoD to receive export controlled data.		X	X	X	X	X	X
DIRECT MILITARY SUPPORT. The technical data is export-controlled and of such military significance to another country or a joint US-foreign program that its release for other than direct support of DoD activities potentially jeopardizes an important military advantage of the US. Release can be made to anyone permitted access to Unclassified export-controlled data for foreign military sales (X), to any component in the joint program (E), and to recipients as directed by the DoD controlling office or higher DoD authority (F).					X	X	X
FOREIGN GOVERNMENT INFORMATION. The foreign government information furnished to DoD is restricted in its distribution to a designated audience.		X	X	X	X	X	
PREMATURE DISSEMINATION. The information relates to patentable military systems or processes in the developmental stage and disclosure at this time except to a designated audience would compromise DoD's interest in protecting the patentable technology.		X			X	X	
PROPRIETARY INFORMATION. The information is 1) owned by a nongovernmental entity and 2) protected by a contractor's Limited Rights Statement 9LRS or other agreement. Therefore, dissemination is restricted to a designated audience.		X			X	X	
SOFTWARE DOCUMENTATION. Software documentation shall be distributed according to the terms of the software license, which may restrict distribution to a designated audience.		X	X	X	X	X	
SPECIFIC AUTHORITY. The specific authority (Executive Order, statutes such as the Atomic Energy or Stevenson-Wydler acts, Federal regulation, etc.) governing the information restricts its distribution.		X	X	X	X	X	
TEST AND EVALUATION. The information results from testing and evaluation of commercial products or military hardware produced by a nongovernmental entity and routine dissemination of such results outside a designated audience could result in unfair advantage or disadvantage to the manufacturer or producer.		X			X	X	
APPROVED FOR PUBLIC RELEASE. The information is approved for public release and does not contain controlled data.	X						
This table is UNCLASSIFIED							

Appendix C

(U) Sample Classified Report Documentation Page, SF-298